

REMARKS

Claims 1-20 are pending in this application, with claims 1, 7, and 14 being independent. No claim has been amended herein. As a result, entry of the foregoing remarks is proper under 37 C.F.R. §1.116(b) because no new issues are raised, no further search is required, and the foregoing remarks are believed to remove the basis of the outstanding rejections and to place all claims in condition for allowance.

As a preliminary matter, the Examiner's several courtesies extended to the Applicants' representative during the in-person Office Interview conducted earlier today, at 2pm, along with Primary Examiner, Tai V. Duong, are noted with appreciation.

As previously noted, claims 1-2, 7-9 and 14-16 have been rejected under 35 USC 103(a) as being unpatentable over Ohe et al., U.S. Patent No. 6,300,994, as modified to incorporate selected features from Ota et al., U.S. Patent No. 5,831,707. In support of this rejection, the Examiner basically asserts that Ohe '994, as a primary reference, discloses all the features, except for "an AC residual image which occurs even in a case of driving by pure AC that is less than 8%" which is alleged disclosed on column 9, lines 54-65 of Ota '707, secondary reference. Specifically, the Examiner asserts that,

"Ota teaches that in an in-plane switch LCD the use of AC driving (Applicant's driving by pure AC) reduces the residual image relative direct current operation (col. 9, lines 54-65) to achieve a display having perferrable quality. Note that Ota confirms the AC residual image would be less than the DC residual image that has already been made virtual zero by Ohe, therefore well within Applicant's range of less than 8%."

Actually, the Examiner's assertion is incorrect, and the cited column 9, lines 54-65

from Ota '707 is misplaced. Applicants respectfully submit that features of Applicants' claims 1-2, 7-9 and 14-16 are not disclosed or suggested anywhere in Ohe '994 and Ota '707, whether taken individually or in combination with any other references of record. Therefore, Applicants respectfully traverse the rejection and request the Examiner to reconsider and withdraw this rejection for the following reasons.

As previously discussed during the Interview, Applicants note that both Ohe '994, as a primary reference, and Ota '707, a secondary reference, are assigned to the same assignee of the instant application. Ohe '994 does **not** qualify as prior art against Applicants' claims 1-2, 7-9 and 14-16 under 35 U.S.C. §103©. This is because the subject matter of Ohe '994 and the claimed invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Even assuming, *arguendo*, that Ohe '994 does qualify as prior art against Applicants' claims 1-2, 7-9 and 14-16, Applicants submit that neither Ohe '994 nor Ota '707, discloses or suggests the features of Applicants' claims 1-2, 7-9 and 14-16. For example:

Independent claim 1 now recites a liquid crystal display device comprising a pair of substrates, a liquid crystal layer held between the pair of substrates, at least one of the pair of substrates being provided with a pair of electrodes for applying a lateral electric field to the liquid crystal layer, and oriented films formed on both of the pair of substrates, wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8%.

Independent claim 7 now recites a liquid crystal display device comprising a pair of substrates, a liquid crystal layer held between the pair of substrates, at least one of the pair of substrates being provided with at least a pair of electrodes for

applying a lateral electric field to the liquid crystal layer, and at least an oriented film formed on the electrodes, wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8%.

Likewise, independent claim 14 recites a liquid crystal display device comprising a pair of substrates, a liquid crystal layer held between the pair of substrates, at least one of the pair of substrates being provided with a pair of electrodes for applying a lateral electric field to the liquid crystal layer, at least a protecting film for protecting at least one of the pair of electrodes, and oriented films formed on both of the pair of substrates, at least one of the oriented films being arranged to cover the protecting film, wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8%.

As expressly defined in each of Applicants' independent claims 1, 7 and 14, as long as "an AC residual image" is kept "less than 8%" even in case of driving by "pure AC", any display defect caused by the AC residual image in the lateral electric field system can be eliminated. This phenomenon has been discovered solely by Applicants in an effort to reduce, if not eliminate, display defects caused by residual image in a liquid crystal display (LCD) device.

In order to appreciate Applicants' discovery in the context of a LCD device, the Examiner should note that the cause of residue image in conventional LCD devices is the application of DC voltage, and is **not** related to application of "pure AC". In other words, the residue image is caused by DC voltage. This is because the image sticking effect in conventional LCD device is related to the transmittance drift caused by DC voltage applied to liquid crystal cells. See page 79 of Electronics and Communications in Japan, Part 2, Vol. 78, No. 2, 1995. Because the residue image is caused by DC voltage, many researchers in the past have endeavored to adjust the application of DC voltage in order to reduce the residue image.

However, if AC is applied, there will be no residue image. As a result, many skilled in the art will not even consider the possibility that residue image can also occur based on "AC driving". However, as Applicants have discovered new phenomenon, and described in the disclosure that in special situations, that is, in a lateral electric field system, residue image can still occur even in the case driven by "pure AC". As a result, the key of solving residue image in such a lateral electric field system is a recognition that residue image does in fact occur even in the case driven by "pure AC".

One of the solutions advocated by the Applicants is to maintain the "AC residue image" in such a lateral electric field system below a certain percentage, i.e., 8% as expressly defined in each of Applicants' claims 1, 7 and 14. Other solutions are described in dependent claims 2-6, 8-13 and 15-20.

For example, dependent claims 2, 8 and 16 further define that "a specific resistance of the liquid crystal layer is 10^{10} Ω ·cm or more". This limitation is **not** described or suggested by either Ohe '994 or Ota '707, whether taken individually or in combination with other references of record.

Likewise, dependent claims 3, 10 and 17 further define that "at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount". Again, this limitation is **not** described or suggested by either Ohe '994 or Ota '707, whether taken individually or in combination with other references of record.

Dependent claims 4, 11 and 18 further define that "a weight average molecular weight of the polymer and the oligomer is at least 2,000 and at most 30,000." Again, this limitation is **not** described or suggested by either Ohe '994 or

Ota '707, whether taken individually or in combination with other references of record.

Dependent claims 5, 12 and 19 further define that “the polymer and the oligomer contain a long-chain alkylene group of at least one of a main chain type and a terminal type.” Again, this limitation is **not** described or suggested by either Ohe '994 or Ota '707, whether taken individually or in combination with other references of record.

Similarly, dependent claims 6, 13 and 20 further define that “at least one of the oriented films is an organic polymer of a polymer and/or oligomer amic acid imide type, a polymer and/or oligomer amide-imide type, a polymer and/or oligomer imidosiloxane type, or a polymer and/or oligomer amide-imide type containing a long-chain alkylene group.” Again, this limitation is **not** described or suggested by either Ohe '994 or Ota '707, whether taken individually or in combination with other references of record.

In contrast to Applicants' discovery as defined in each of Applicants' independent claims 1, 7 and 14, neither Ohe '994 nor Ota '707, as previously discussed, discloses the feature “wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8%.”

Nevertheless, the Examiner cites column 9, lines 54-65 of Ota '707 for allegedly disclosing the feature “wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8%.”

However, this citation is misplaced. The cited column 9, lines 54-65 of Ota '707 only refers that:

“the liquid crystal can be driven by an alternating current because a voltage ... can be charged and retain by making $V_{TH} = 9.3$ V for exceeding the value... Further, a **residual charge** accumulated in the passivation film and other elements can be decrease and

accordingly, an image display having a preferable quality without generating the residual image phenomenon can be realized."

According to Ota '707, residual image is caused by "charge". As a result, there is **no** residual image, if the liquid crystal is free from "charge". In other words, **no** residue image can be generated in "pure AC".

This is in contrast to Applicants' claimed phenomenon in which "residue image" can be generated even in a case of "pure AC" (even in charge-free condition). If anything, Ota '707 actually teaches away from Applicants' discovery of the phenomenon that residual image can be generated even in "pure AC".

The law under 35 U.S.C. § 103 is well settled that "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital System, Inc v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). The Examiner must point to something in the prior art that suggests in some way a modification of a particular reference or a combination of references in order to arrive at Applicants' claimed invention. Absent such a showing, the Examiner has improperly used Applicants' disclosure as an instruction book on how to reconstruct to the prior art to arrive at Applicants' claimed invention.

Moreover, any effort to combine prior art references, there must be a showing of reasonable expectation of success, and the prior art references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 2143. In other

words, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USQP 494, 496 (CCPA 1970).

As previously pointed out, the Examiner has not considered key limitations of Applicants' claims 1-2, 6-7 and 14-16 in full, and has failed to provide any suggestion or motivation to modify Ota '707 into Ohe '994 in order to arrive at Applicants' claims 1-2, 6-7 and 14-16. Therefore, Applicants respectfully request that the rejection of claims 1-2m 6-7 and 14-16 be withdrawn.

During the Office Interview, the Examiner has acknowledged the need to open prosecution of the instant application and has indicated that an update search will be conducted. The Examiner has also indicated that he "will contact [the Applicants' representative] with any information about needed claim limitations (possibly from different aspects of the disclosed invention as defined in the dependent claims 2-6, 8-13 and 15-20) to place the case in condition for allowance depending upon the results of the search." Again, the Examiner is respectfully requested to contact the Applicants' representative to advance the prosecution of the instant application.

Lastly, claims 3, 10 and 17 have been rejected under 35 USC 103(a) as being unpatentable over Ohe '994 and Ota '707, as applied to claims 1-2, 7-9 and 14-16 above, and further in view of Mishina et al., U.S. Patent No. 5,350,539. Similarly, claims 4-6, 11-13 and 18-20 have been rejected under 35 USC 103(a) as being unpatentable over Ohe '994 and Ota '707, in view of Mishina '539 as applied to claim 3 above, and further in view of Yu et al., U.S. Patent No. 6,066,696. Since these rejections are predicated upon the correctness of the rejection of claims 1-2, 7-9 and 14-16, Applicants respectfully traverse these rejections primarily for the


same reasons discussed against the rejection of claims 1-2, 7-9 and 14-16.

Moreover, Applicants submit that Ohe '994, Ota '707, Mishina 539, and Yu '696 do not disclose or suggest the feature of claims 1, 7, and 14 wherein an AC residual image which occurs even in a case of driving by pure AC is less than 8% and, as a result, request that the rejections of claims 3-6, 8-13 and 15-20 be withdrawn.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (1113.40340X00).

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP


Hung H. Bui
Registration No. 40,415

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